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NEWSLETTER OF THE AUSTRALIAN NETWORK FOR PLANT CONSERVATION

Reaching Out ANPC & the BGCI Congress

Nineteen ninety five is conference year for the Australian Network for Plant Conservation.

This year, in September, Botanic Gardens Conservation International will hold its 4th International Conservation Congress in Perth. The Congress title is *Reaching Out - Botanic Gardens and Conservation into the 21st Century* and ANPC will not only be involved in the organisation and conduct of the Congress, but will hold its own biennial meeting during Congress week.

The ANPC had its origin in the *Protective Custody* conference held in Canberra in 1991. From an original plan to hold a get-together of botanic gardens personnel to discuss what the gardens community could do to help in the fight for the conservation of Australia's threatened plant species developed the idea of **integrated conservation**, which implies a blending of the expertise of those working in what the 'insiders' call **in situ** conservation, (that is conservation of plants and animals in the wild), and **ex situ** conservation, (conservation away from the wild, as in botanic gardens and zoos). It is universally recognised that the preservation of habitat is the most desirable means of conserving the biological diversity of all organisms. But some of these organisms are so desperately threatened that the only means of

saving them will be to secure them outside their natural habitat until suitable places can be located to establish them. The article in this issue of *Danthonia* by Anne Cochrane and David Coates of the WA Threatened Flora Seed Centre emphasizes this. Even those that are in less peril may benefit from research or propagation in botanic gardens and other establishments.

Last year's ANPC conference in Hobart endorsed the need for co-operation between in situ and ex situ workers. The ANPC is being seen as a model to be emulated by groups seeking to best care for their natural flora.

In the past 10 years the role of botanic gardens in biodiversity conservation has expanded and been refined. Many new conservation techniques are being pioneered (see the work on seed germination in botanic gardens in South Africa and at Kings Park in Perth). Botanic gardens are seen as key players in plant conservation in many parts of the world and members of ANPC can help guide the world botanic garden community when it meets in Perth.

Among the topics in the plenary sessions will be: *Biodiversity Conservation: turning concerns into action; Reaching Out to the World: collaboration for conserva-*

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EDITORIAL

The ANPC Advisory Committee had its fourth meeting in Canberra at the end of November. The development of regional networks was a major item on the agenda. The varying ways in which they have developed is an interesting feature of them. Since the first ANPC conference there have already been four regional groups established and two are planned for the near future. As agreed at that conference local networking is proving to be a vital part of the ANPC's program. With our second national meeting planned for Perth next year the Advisory Committee suggested that SW Western Australia would be an important region in which to establish an ANPC group before spring next year. Members already involved in regional networking are to be congratulated for their efforts.

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Compliments of the season to you all, and here's some holly for you (all right, it's a grevillea). Don't forget to renew your subscription for 1995!



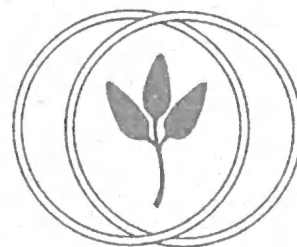
Erratum

In our article 'Rare Plant Work in Western Australia', published in the last issue of *Danthonia*, on page 6, column 2, paragraph 2 we stated that 100 viable seed of each species are held. This should read **1000** viable seed. See the article on page 4 for much more detail.

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tion; *Plants and People: sustainable development*; *Conservation Biology*: what are the scientific frontiers for conservation?

The program will also include workshops and seminars on environmental education, germplasm networks, data management and transfer, CITES, and practical sessions on tissue culture and micro-propagation; provenance selection and molecular methods for assessing variation.

The biennial meeting of the ANPC will take place on the Wednesday of Congress week. In addition to reports by the National Office on work done since the Hobart conference there will be presentations of the reports and recommendations by the three ANPC Working Groups; on Germplasm Storage, Databases, and Translocation. The ANPC Advisory Committee will also meet during the week. The meeting will be primarily the forum for setting ANPC's agenda for the next two years.

The opportunity for ANPC members to meet like-minded people from all parts of the world will be invaluable. We recommend all who can make it to Perth next September to register for the Congress and ANPC meeting when the registration forms are sent out in February, 1995.

Mark your diary now for 25-29 September 1995. Enquiries in the meantime to "4th International Botanic Gardens Conservation Congress", c/o Congress West, PO Box 1248, West Perth, WA 6872 or Dr. Kingsley Dixon, Kings Park & Botanic Garden, West Perth, WA 6005, fax (09) 322 5064

MEMBERS ACTIVITIES

Flora Rescue Plan for *Pimelea pauciflora*

Based on a report by Sue Wells, Royal Tasmanian Botanical Gardens

Pimelea pauciflora belongs to the family Thymelaeaceae, a worldwide family of 45 genera. Within Australia there are 8 genera with 90 species. Of the ca. 80 species of *Pimelea* that occur in Australia, 21 species and subspecies are found in Tasmania, of which 11 have some form of conservation rating. (see Kirkpatrick et al; Reservation and Conservation Status of Tasmanian Native Higher Plants, Department of Parks Wildlife and Heritage, Tasmania, 1991)

Pimelea pauciflora R. Br., the 'poison riceflower', extends from SE NSW, through Victoria and in scattered populations in NE and Central Tasmania, often associated with watercourses. It is coded 'ur2' in Tasmania, being unreserved and occurring in fewer than 20 10km grid squares with a very local distribution.

A rescue operation for a population of *Pimelea pauciflora* threatened by roadworks at Nunamara, on the Tasman highway was carried out on 19 January 1993 by the Royal Tasmanian Botanical Gardens (RTBG) at the request of the Department of Roads and Transport (DRT). Twenty five seedlings, cutting material and seed were collected and propagated at the RTBG. All seedlings and 25 struck cuttings grew well and were potted into RTBG native potting

mix in 6" pots. Collected seed failed to germinate. The seed probably requires fire to trigger germination, as observed at the time of collection. Potted up plants were stored in the open nursery area from Christmas 1993 until replanting time. By September 1994 the plants were from 30 to 60 cm high and were tip pruned before planting, with the prunings being retained for further cuttings.

The RTBG met with an officer of the DRT on site prior to planting and agreed on planting positions. All plants were planted on the bush side of the bank of the drainage ditch behind the road batter, in the hope that this would provide a damp but well-drained site for the *Pimelea*, a preferred habitat for this species. Plants were set in groups of three over a distance of about a kilometre, on the eastern side of the Tasman Highway, where all the previous populations had been located and close to the areas from which the parent material had been collected.

The *Pimeleas* were planted in groups of three and soil-wetting agents were added as an experiment to two of every three groupings. Thus the first group of three had Zeolite added, the second had Hydroflo and the third acted as a control with no additive. The soil on the bank was moist at the time of planting and plants were watered in. No staking was used. Photographs were taken of the planting sites and the DRT Nunamara Roadworks maps on which the original

populations were plotted were again used as a reference.

Eleven plants grown on from the seedlings collected in January 1993 were returned to 'site 1', seven seedlings and one struck cutting were planted at 'site 2' and 'site 3' received 28 struck cuttings. The few *Pimelea pauciflora* plants that were growing in remnant bushland up to 10m from the roadside have generally escaped disturbance from the roadworks and remain as isolated large shrubs near the new fenceline. Others were observed within the paddock behind the fenceline. The RTBG and DRT were fortunate to obtain the interest of a nearby Landcare Group which has undertaken to observe, monitor and occasionally water the new plantings.

Since there are currently no reserved populations of *Pimelea pauciflora* within Tasmania, the new road reserve on the Nunamara section of the Tasman Highway with its small *Pimelea* population will become significant. It will be important to know how the newly planted population fares.



WESTERN AUSTRALIA'S THREATENED FLORA SEED CENTRE AND ITS ROLE IN THE CONSERVATION OF GENETIC DIVERSITY

A. Cochrane and D. Coates
WA Herbarium, Department of
Conservation and Land
Management

Threatening processes, particularly loss of habitat, weed invasion, and dieback disease (*Phytophthora*) have, and continue to be, major factors in the local extinction of native plant species in Western Australia. Loss of populations and substantial reduction in population size may not necessarily lead to immediate extinction but usually results in loss of genetic diversity. In situ conservation reserves are as much at risk from dieback disease as are unvested crown lands and private property. Where population extinction in the wild cannot be prevented genebanks or germplasm storage facilities can be utilised as an interim solution for prevention of loss of genetic diversity within a species range or as a last resort in preventing the extinction of the species (Morse et al. 1993). One of the most cost effective methods for genebanking in plants is the long term (>50 years) storage of seed at low (-20°C) or ultra-low (-150°

to -196°C) temperatures.

Recently, the Western Australian Department of Conservation and Land Management established a low temperature seed storage facility (Threatened Flora Seed Centre, TFSC) for the purpose of contributing to the conservation of the State's rare or threatened plant species susceptible to the dieback disease (*Phytophthora*) and to aerial canker. The principal objective of the TFSC is to develop a comprehensive seed-based germplasm collection for *Phytophthora*-susceptible rare or threatened plant taxa in Western Australia. The initial aim is to capture 75-80% of all genetic variation within each taxon, and to utilize appropriate protocols for the medium and long term storage of seed from those taxa. The maintenance of an integrated database on seed provenance and seed biology for each taxon is an important part of the objectives of the seed centre. The TFSC's primary concern is thus to ensure the maintenance of genetically

below: *Phytophthora* dieback in
Stirling Range National Park,
photo M Dudzinski



representative seed collections of Western Australian threatened flora under medium and long term (>50 years) storage conditions as an interim solution for the prevention of species extinction and genetic degradation and/or local extinction of critical populations.

Many rare or threatened taxa are not well known taxonomically, ecologically, geographically and/or phenologically, and obtaining seed samples that have a wide genetic base is often difficult. This is exacerbated by small population size, low or sporadic seed production, high seed predation levels, and/or poorly known seed biology. In addition, all sampling strategies are subject to the bias derived from fluctuations in the genetic contribution of individuals to the genepool due to disturbances such as fire, drought and disease. Even so, the genetic quality of any seed sampled warrants some critical considerations to ensure that the genepool has optimal representation.

Sampling Strategies

Sampling is driven by a number of key considerations, namely the genetic differences between populations and between individuals within populations, the number of populations, and the viability of propagules from a particular species. It is necessary to ascertain the number of breeding plants contributing to the targeted seed crop, the seed production status of each plant and its maturation status. It is also useful to have some understanding of the spatial structure of the population when considering pollinator behaviour and seed dispersal

mechanisms.

Several questions need to be answered prior to commencing a conservation collection. Firstly, what species do we collect? Secondly, how many populations of that species? Thirdly, how many individuals within each population should be collected? And last, how many propagules from each individual should be collected? No precise guidelines can cover all situations and the recommended guidelines must be adapted for the variability inherent in all plant species.

What species to collect is dependent on the degree of threat, the range of the species, the number of individuals and populations, and the conservation status of the species. The West Australian Department of Conservation and Land Management's (CALM) threatened and poorly known flora list is used as the basis for the TFSC's seed collection work. CALM currently lists 1992 plant taxa with priority for conservation (Ken Atkins pers. comm. 14/09/94). There is very little data on species susceptibility to *Phytophthora*, with most information coming from field observations, and limited isolation of fungal material from infected plant tissues. The problem is of greater concern in the South West Botanical Province and in the higher rainfall areas of the south coast and in areas receiving more than 600mm of rainfall per annum. The most highly susceptible species occur within the families Epacridaceae, Proteaceae, Fabaceae and Myrtaceae. Genera from these families represent a large component of the genet-

ic diversity of the species rich coastal heathlands. Currently some 200 taxa are targeted for collection and this represents about 10% of flora on the threatened and poorly known flora list for Western Australia. Many of these taxa face at least localised extinction in the wild within the next 10 to 20 years.

The following TFSC seed collection protocols are primarily derived from work by Brown and Briggs (1991) and based on guidelines used by CSIRO - Australian Tree Seed Centre. The design of genebanks and protocols recommended for use in genebanks have been formulated by the International Board for Plant Genetic Resources (IBPGR) (Cromarty et al. 1985, Hanson 1985, Ellis et al. 1985a and Ellis et al. 1985b). The Australian Network for Plant Conservation (1993) adequately summarises the collecting guidelines for conservation collections of native plants, and are presented in brief below. It has been recognised that difficulties exist with following guidelines set up by institutions based in the northern hemisphere as Australian flora is highly variable and often poorly known. Armstrong (1991) argued for a national plant germplasm program, and recently a working group was set up through the Australian Nature Conservation Agency to develop guidelines for a National Germplasm Storage Strategy. A similar group has already developed a draft State Strategy for Native Plant Germplasm Storage in Western Australia.

Collection Strategies

1. *Number of Populations per Taxa.* All populations should

be sampled if the number of populations is less than five, and at least five if the number of populations exceeds five.

2. *Number of Source Plants per Population.* The optimum sample size for a given population is between 10 and 50 families.

3. *Number of Seed per Source Plant.* A thousand seeds per population is the ideal minimum number of seeds required to adequately represent and conserve a genepool under long term storage conditions.

4. *Multi-year Sampling.* Quantities of seed sufficient for long term storage may be accessed by implementing a repetitive (albeit benign) seasonal sampling regime until an adequate sample is obtained. Much of the flora of WA requires this type of sampling strategy. This fact has led to the use of traps for the collection of some seed. Seed traps constructed of fibreglass flywire netting supported by tie wire and metal fence drop-pers were tested in spring and early summer 1993 on a number of species of *Adenanthos* on the south coast of WA. The traps were left in-situ for up to 6 months of the year during spring and summer, and checked as regularly as possible during that time. Traps are a cost-effective and labour saving device where differential fruiting over an extended period of time necessitates frequent visits to a site. Monitoring of the traps is required on a fortnightly, if not weekly, basis to prevent excessively high levels of predation and subsequent seed loss. Additional seed traps will be constructed in other threatened populations of native flora

over the next few years.

Laboratory Procedures

1. *Registration.* Documentation of all details of the collection, testing and storage of accessed seed is critical if resampling and regeneration programs are to be successfully implemented. Voucher specimens are lodged with the WA Herbarium for all seed collected by the TFSC staff. All information is computer databased and is linked to the Herbarium's WAHERB database.

2. *Cleaning and Fumigation.* Seed is cleaned to the highest practical level of purity possible. Invertebrate predation may be arrested by fumigating the seedlot with carbon dioxide using heat-sealed laminated plastic bags.

3. *Quantification.* Detailed quantification of seedlots is important and requires accurate assessment and databasing to ensure that adequate viable seed is being maintained during storage and monitoring.

4. *Germination/Viability Testing.* Representative subsamples of each seedlot are tested for viability prior to storage.

5. *Moisture Content Determination.* Moisture content and temperature are two of the most important factors in the requirements for seed storage. Seed is dried to between 4-7% moisture content prior to storage at -18°C .

6. *Packaging, Storage and Monitoring Regime.* Laminated aluminium foil is used as packaging, with carbon dioxide as an effective storage medium. Seed is monitored regularly to assess the species' response to long term storage.

Most seed collection field

trips to date have been centred on the south coast and Swan coastal plain where the problem of dieback is most severe. The seed centre now has over 170 accessions for over 74 taxa in 16 genera with provenance, germination and storage details. These include taxa from the families Proteaceae, Epacridaceae, Fabaceae, and Myrtaceae.

Currently the TFSC provides the only means for conserving the genetic resources of a large number of rare and geographically restricted taxa critically threatened by *Phytophthora* species. Research on native seed germination and storage will assist scientists in their understanding of seed biology, and further our knowledge of the unique West Australian flora. The germplasm will be made available for re-introduction programs and for biochemical and molecular genetic studies on patterns of genetic variation and mating systems where these data are required for developing management and conservation strategies for critical taxa. Seed will be monitored regularly to ascertain its response to long term storage.

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REGIONAL CO-OPERATION

Conserving *Carpoxylon macrospermum*, an endangered palm from Vanuatu

John L Dowe, Townsville Botanic Gardens

The archipelagic nations of the south-west Pacific are not renowned for their plant conservation activities. Indeed, basic information related to the subject is restricted to a handful of projects, and conservation status for plant species is confined to a few families that are being researched by specialists. Current interest in the region has been stimulated by taxonomic activity focussed on the palms of the region and in particular Vanuatu, where the palm flora consists of 20 species of which 12 are endemic. Three Vanuatu species have received notification in the IUCN Species Survival Commission's Global Action Plan for Palm Conservation. These include *Carpoxylon macrospermum* H. Wendl. & Drude, *Veitchia montgomeryana* H.E. Moore and *V. spiralis* H. Wendl.; all of these species have an endangered status.

The *Carpoxylon macrospermum* Project

Supported by the Forestry Department of Vanuatu and the Foundation for the Peoples of the South Pacific, the Profitable Environmental Protection Project (a USAid funded group) has embarked on a program to conserve *Carpoxylon macrospermum*, a species that is

known to number less than 100 individuals. The project proposes to establish a commercial enterprise that will enable the palm to be reintroduced into the wild and also into cultivation. The genetic diversity of the known palms and distributional and demographic data are being determined to enable the formulation of a recovery/conservation plan.

History of *Carpoxylon macrospermum*, and a progress report on the project.

Carpoxylon macrospermum was first described by the German botanists H. Wendland and O. Drude in 1875 from fruit collected by the English naturalist John MacGillivray during the voyage of the *Herald* through the southern islands of Vanuatu. The exact location and date of collection, distribution and general description of the palm were not recorded. Subsequently, botanists were enthralled by the mystery of *Carpoxylon* and many attempted to relocate the palm. Some discounted the species' existence as they were unable to locate it, or otherwise argued that it was a taxon of dubious status. The most thorough search was undertaken by American botanists Foster and Hodel in 1982, who, also not being able to locate the palm, suggested that it may have become extinct.

In November 1987, an extensive field trip, sponsored by the Palm and Cycad Society of Australia, was undertaken through Vanuatu in conjunction with initial studies relating to a review of the palm flora of the south-west Pacific (Dowe

1989). Prior to leaving for Vanuatu, I had familiarised myself with the palms of Vanuatu through the literature and was aware of the mystery of *Carpoxylon*. Due to Foster and Hodel's suggestion that the palm may be extinct, I did not plan to visit Aneityum, the island from where it was originally reported. Instead, and because of time and logistic constraints, I concentrated on the known localities of other palm species. In the course of field study on the island of Espiritu Santo, an island some 800 km to the north of Aneityum, I was taken to a locality by a local guide to see 'a palm that is different'. To my astonishment, I was shown a group of four of the supposedly extinct palms, which I immediately recognised by the distinctive fruit that matched the original 1875 illustration.

Upon returning to Australia, I contacted palm specialists Natalie Uhl (Cornell University, New York) and John Dransfield (Royal Botanic Gardens, Kew) about the 'rediscovery'. Uhl offered to undertake joint descriptive and taxonomic work with me. In April 1988, on a grant from the H.E. Moore Foundation (Cornell University), I returned to Vanuatu to collect complete samples of leaves and flowers from which we were able to prepare an amended description, and place the palm within the classification system for the Arecaceae (Dowe & Uhl 1989).

In the years to follow, the palm's precarious existence was highlighted in various published articles, and corre-

spondence with botanists and other scientists who had an interest in palm conservation was initiated. Dennis Johnson, Chairman of the IUCN Spe-



Carpoxydon macrospermum on southern Espiritu Santo, photo: J Dowe

cies Survival Commission's Palm Specialist Group, corresponded with me and proposed an action plan to conserve the palm (Dowe, in press).

In early 1992, I was approached by Patricia Curry, Government of Vanuatu Forest Botanist, and Nora Devoe of the Foundation of the Peoples of the South Pacific, to help formulate a conservation strategy for *Carpoxylon*. On Espiritu Santo during 1993, Devoe (1994) undertook field work that revealed a scattered, predominantly cultivated population of some 50 plants of which about 25% were mature fruiting specimens. These findings encouraged PEPP to develop the project as one of their major contributions to the region. Further investiga-

tions by botanists working for ORSTOM, the Paris-based scientific organisation, exposed an additional 40 palms on the island of Malekula, whilst on

Tanna about 10 palms were located by Australian botanist Jim Gage. Presently the known population stands at just less than 100 individuals. In March 1994, I was approached by Devoe to undertake field work, the results of which will contribute toward a strategic plan for the palm's conservation. The island of Aneityum, the purported type locality for the species, is to be searched thoroughly in the current phase for the project. Isozyme and DNA analyses will be used to determine the extent of genetic variation within the population and may indicate

the sequence and direction in which the palm has spread, which is presumed to have been predominantly by human activity. Field work for this purpose will be undertaken in November/December 1994.

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Recent Publications

Conservation of Lowland Grasslands in South-eastern Australia, Edited by Keith McDougall and J.B.Kirkpatrick, World Wide Fund for Nature, Australia, 1994, 187pp, large-format (A4) paperback, \$25 (including postage and handling)

The lowland native grasslands of south-eastern Australia are Australia's most threatened native plant communities. This publication results from an Australian heritage Commission funded study conducted by WWF Australia. The report identifies the most significant grassland remnants occurring in Tasmania, Victoria, South Australia, New South Wales and the ACT. Twenty six lowland grassland communities were identified through floristic survey of eighty sites and details are given of location, characteristics, exotic and threatened species, conservation status, threats and recommendations for management.

The report highlights the extreme fragmentation of these important communities and the need for sensitive management of valuable remnants on private and Crown lands. The report is an invaluable guide to land managers, councils and governments on the conservation of Australia's last temperate lowland grasslands.

A Vegetation Survey of Disused Railway Corridors in the Mid-North Region of South Australia, July-November 1992, by M.K.Hyde, Nature Conservation Society of South Australia Inc., Adelaide, 1994, 185 pp, available for \$16 (posted) from NCSSA, 120 Wakefield Street, Adelaide, SA, 5000

Full plant species lists for remnant vegetation, with national and regional conservation status codings and full conservation recommendations. The survey was funded by Save the Bush, a Federal government initiative to promote the retention and conservation of native vegetation.

Bibliography of Fire Ecology in Australia (including Fire Science and Fire Management) (4th edition), by Malcolm Gill, Peter Moore and Warren K.Martin, NSW National Parks and Wildlife Service, 1994, available from NPWS Information Centre, PO Box 1967, Hurstville, NSW 2220 for \$10 plus \$2.50 postage, (enquiries phone (02) 585 6333 or fax (02) 585 6555

In addition to the bibliography, references are listed under key words (up to four key words per title). References are entered by author's names and dates of publication. This is an essential publication for practitioners, academics and students in the fields of fire research and fire management.

What Seed Is That? A field guide to the identification, collection and germination of native seed in South Australia, By Neville Bonney, artist Anne Miles, 324 pp, Available from Greening Australia

(South Australia) Inc., GPO Box 9868, Adelaide, SA 5001

The publication looks at more than 300 plants suitable for revegetation programs in South Australia. regional plant lists are also included. There are 250 line drawings plus a further 50 colour illustrations of the fruiting branch, fruit and seed. each sketch has accompanying notes including how and when to collect, how and when to propagate, plant description, conservation status in South Australia, habitat and ecology. In addition, there are sixty colour photographs of native fruits and vegetation association types within southern Australia. A further 200 different native seeds have been photographed in actual size and colour. the author works with Greening Australia in South Australia.

Growing Understorey Seed, by Joanna Seabrook, Greening Western Australia, 1994, 58pp., Available from Greening Western Australia, 1118 Hay Street, West Perth, WA 6005, ph (09) 481 2144

Includes sections headed 'Why Grow Seed?' and 'Establishing a Seed Orchard'

Keeping the Bush in Our Backyards: Encouraging Your Local Community to Protect Remnant Vegetation, Prepared by Context for The Conservation Council of Victoria, 1993, 32pp, Available for \$7.50 from Context Pty Ltd, Box 193, West Brunswick, Vic 3055, ph (03) 380 6933, fax (03) 380 4066

Contains chapters on creating a community climate of valuing native vegetation, the

ANPC Regional Groups

ACT & South East NSW

The inaugural meeting of members in the ACT and south-east region was held at the Australian National Botanic Gardens on 16 November over lunch. Dr Helen Hewson, Acting Director of the ANBG gave a brief opening address, welcoming those present to the Gardens and wishing the group success. The meeting was well attended, with 22 people representing a range of interests and organisations. The main purpose of the meeting was to discuss the need for regular meetings for the region, and the format that they will take. It was felt that to commit the group to a particular style at this stage would be rather premature and that a structure would evolve as issues relevant to the region were discussed. A general theme of conservation of remnant vegetation in the rural landscape emerged as being of concern to all present. The role of the group was primarily seen as one of sharing of accurate information both within the group and with the wider conservation community. The potential for working groups to be formed to work on topics of interest to a subset of the group was raised.

The next meeting is scheduled for half a day on a weekend, followed by much socialising (see below). The aim of the meeting is to bring together, and discuss the implications of, information in the form of maps of remnant vegetation, threatened plant taxa and ANPC membership in the south east region. NSW Na-

tional Parks and Wildlife Service, CSIRO Division of Plant Industry, the Centre for Resource and Environmental studies, and the ANPC National Office will be providing the relevant maps. Valda Corrigan of NSW NPWS will prepare information to provide to the group on conservation agreements. The meeting will be convened by Henry Nix, Chair of the ANPC Advisory Committee, with organisational assistance being provided by a small committee.

Anyone intending to attend future meetings for the region is requested to prepare a written profile of their interest and expertise. These profiles will be collated and distributed to members in the region before the next meeting, and will constitute a valuable inventory of human resources. Please send profiles to Jeanette Mill, ANPC Extension Officer, by the end of January. Preference is for electronic copy through e-mail to jmill@anbg.gov.au, or send to the National Office.

ACT and South East NSW Region

Next Meeting

Saturday 25th February 1995, 2pm to 5pm, followed by a BBQ, BYO salads, everything else provided for a cost of \$3.00 per person to be paid on the day.

Location: Seminar Room, Centre for Resource and Environmental Studies (CRES), 5th Floor, Hancock Building, Australian National University, Canberra, ACT.

Please RSVP by Friday 17th Feb to Jeanette Mill at the

ANPC National Office, Ph: 06 250 9509

A name is needed for the region. Please bring any ideas to the meeting.

Subtropical Region

Thirteen people attended the first meeting of the newly established ANPC group covering south-east Queensland and north-east New South Wales which was held at Limpinwood Gardens on Saturday 5 November. Opening discussions concerned a name for the group which could easily identify the area in which we worked without the use of state names as the area covered two states. The 'Subtropical Region/Branch' was suggested and all were in agreement that it was a complimentary name to cover the area from Maleny to Coffs Harbour.

The need for a newsletter within this area to list exactly what each member was doing and what information was available, so as not to double up on work already being carried out was discussed and Klaus Querrengasser volunteered to look further into this.

Members were asked to prepare lists of threatened species within their own areas and to gather information into what actions are being taken to ensure their survival. These lists will be collated and discussed within the Group for further action to be taken if required. The Group will endeavour to collect listings of rare or threatened species from both state herbaria, national parks services and other relevant bodies to use as a reference for research and action.

Publicity material will be

worked on for release to local newspapers etc. to emphasise the plight of threatened plant species in the area. This will be an ongoing campaign which will also raise awareness of ANPC as a body dedicated to such work.

Concern was expressed about the collection of seed and/or cutting material from wild stands of threatened species for use by nurseries and for 'Bush Tucker' use. The new Queensland Government legislation regarding the right of the State over plants in the wild was raised by Bruce Tinsworth who will attempt to obtain more information on how this will work. Bruce also explained the work being done in the Ipswich area by the local Council, SGAP members and others and this created enormous interest, and as this was seen as a possible role model for other areas it was decided to hold the next meeting at Ipswich.

ANPC Subtropical Region

Next Meeting

Saturday 18 February , 1995 at 11 am Queensland time!!

At The Horticultural Complex
Ipswich College of TAFE
Bundamba Campus
cnr. Byrne & Wall Street
Bundamba

BYO Lunch (BBQ available; 3 minutes to fast food outlets!)
for more information please
contact Bruce Tinsworth (07)
282 5455 (home)

Victorian Group

At the September meeting David Cheal provided a stimulating talk for a small but hardy group of people. David argued that objectivity in science is a myth, but a rather useful myth nonetheless. His main concern was that everyday terms used in science (such as 'disturbance' and 'stability') had 'rubbery' definitions, which allowed a range of interpretation of research findings. John Delpratt gave the example of the word 'recalcitrant', which has a narrow definition in seed biology, but which is often used more loosely, even among seed biologists.

David also argued that some scientists, by allowing misinterpretation of their work to go unchallenged, diminished its value. He suggested that the development of jargon within specialised areas of science actually provides for more rigorous definitions of the terms being used, and therefore opportunity for more productive scientific discourse. While this may seem an exclusive approach, at least it avoids both deliberate and accidental misinterpretation.

At the December meeting of the Victorian Group Andrew Smith from the Royal Tasmanian Botanical Gardens spoke about the work of the Tasmanian Threatened Plant Recovery Committee.

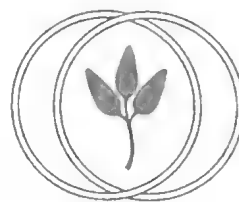
About 25 people attended representing a range of members from around the Melbourne area. Jeanette Mill and Mark Richardson from the National Office also attended. Mark gave a brief description of the ANPC and its current projects for people new to the

Network.

Andrew Smith started his talk with a summary of the plant conservation work that the Royal Tasmanian Botanical Gardens is doing and how their views to plant conservation have changed. Much of the work that the Gardens is doing has been in conjunction with the Tasmanian roads authority and has mainly involved the transplanting of plants affected by road works. This produced some good discussion on matters such as phytosanitation. The dangers of such work being used to defend development work was also discussed.

Andrew described the make-up of the Species Recovery Group and the role it plays in determining priorities and in helping in the development of recovery teams. The group not only has a number of 'core members' who attend each meeting but also Network members who are of particular value when gaining a wider opinion or when establishing recovery teams (see also Sue Wells' article on page 3 of this issue of *Danthonia*).

The meeting was followed by cheese and biscuits and more networking!



ANPC Working Group News

The Germplasm Working Group held its first meeting at the Australian National Botanic Gardens on November 24. Members of the group are: Kingsley Dixon, Convenor, David Coates, Peter Lawrence, Jock Morse and Dale Tonkinson. Objectives and strategies were set. A short protocols document will be produced, as well as a more lengthy document on standards for germplasm storage for plant conservation in Australia. A first draft of the latter is to be produced by April 1995. The second draft will be circulated to the ANPC Advisory Committee and interested members by June.

The Plant Translocation (formerly 'Reintroduction') Working Group is planning to hold a teleconference soon, followed by a 'face-to-face' meeting in February or March, 1995. Among the issues being considered by the Group are guidelines for translocation (information, resources, implementation strategies, criteria for measuring success and monitoring programs), factors critical to long-term success, and problems associated with translocation, such as the risk of introducing diseases or weeds, ethical concerns and the maintenance of the genetic integrity of populations.

The Database Working Group now has a Convenor, John Hook, of the Centre for Plant Biodiversity Research (ANBG/CSIRO) who is working up a timetable for further action.

INetPC

A little over six months old, and the Indonesian Network for Plant Conservation (INetPC) now has over sixty members, including 20 Indonesian organizations and 5 international organizations. This month Kebun Raya Indonesia (Indonesian Botanic Gardens) purchased a new Macintosh LC575 for INetPC, which has greatly increased staff productivity!

INetPC has assumed responsibility for the Bogor Informal Conservation Meetings, and as our first offering we are sponsoring a seminar in December on electronic networking and internet access in Indonesia.

The Executive Advisor to INetPC, Jeanine Pfeiffer, will be touring the Western United States in January and February to raise support for INetPC via a slide presentation on Indonesian biodiversity. The third edition of our newsletter, *Eksplorasi*, will come out in December, and we are hoping that some of our neighbors to the south will join the Network and contribute articles.

Through INetPC interested Australian members of ANPC can acquire a new publication on Indonesian wild orchid species: many species are also grown in Australia, such as *Phalaenopsis amabilis* and *Grammatophyllum scriptum*. As part of INetPC's memorandum of understanding with ANPC, the two organizations are co-operating to bring an Australian Volunteer on board to assist INetPC in 1995.

continued from page 9

pilot BushCare project, setting up and maintaining a local bush care group, ideas for community education and resources and contacts.

Managing Your Bushland, by BMJ Hussey and KJ Wallace, published by WA CALM and available from Department of Conservation and Land Management, PO Box 104, Como, WA 6152, tel (09) 334 0333 for \$19.95, plus postage and handling of \$8.00 within Australia.

Managing Your Bushland is a guide for busy farmers and land managers; a practical guide for people wanting to preserve or expand native bush on their land. It's written by experts with years of experience in nature conservation. The book covers a range of topics including the value of remnant bushland, managing native flora, how to deal with problem weeds and poison plants, fire control and plant regeneration, managing native animals, and dealing with feral animals. Throughout the book are short features on plants and animals together with a source of further help and information.



SPECIES PROFILE

Cynanchum elegans - White-flowered Wax Plant

Maria Matthes and Sharon Nash
NSW National Parks and Wildlife
Service

Part two - The Recovery Process

Cynanchum elegans has been one of the more fortunate of the endangered plant species in NSW. The National Parks and Wildlife Service are attempting to recover under funding from the Australian Nature Conservation Agency. The recovery process is basically in two sections: research into the ecology of the species and the protection of the populations and their habitats.

This species is difficult to conserve for two reasons:

1. its biology and structure makes research difficult; and
2. the majority of populations are on freehold land which increases the difficulty of the processes involved in protecting the species.

There are six local government areas involved, with populations occurring on private land, in council reserves, under extraction zoning, and on land owned by various government agencies. We have had successes, but to have the success hasn't been simple and there have been some losses.

Population Ecology

We are investigating the population ecology of *C. elegans* through the monitoring of five sites for growth, fecundity, response to fire, vegetative reproduction and disturbances.

Patience is certainly required when studying a climbing, twining plant which suckers profusely. It is virtually impossible to determine what constitutes individual plants, above ground.

Although, it has been extremely dry, with many plants wilting, none have succumbed to the drought conditions. The suckering habit appears to be a survival response in times of stress, with an increase in young suckers after disturbance.

Very few fruit - seven in total - were produced at the study sites. The cause for this lack of production is uncertain and may be related to drought conditions. The lack of fecundity has been identified as a phenomenon being in need of further research - i.e. it could be due to lack of viable pollen or a lack of pollinator or some other factor.

Two sites, which are not being monitored this year (luck of the draw - and have changed plans for next years

Below: Cynanchum elegans at Kooragang Island, 'bagged' fruit to the left. Photo M Matthes

monitoring) did flower and set fruit prolifically. Unfortunately, the fruit at both these sites, one in the Illawarra Region, south of Sydney and the other in the Hunter Region near Newcastle, were subject to heavy predation by an unidentified beetle. We have observed the insect in its larval and adult stages. The beetle is being sent to CSIRO Division of Entomology for identification and information on its life history.

The seed which has been collected this year is being used in trials to determine the its viability, dormancy characteristics and to study the seed bank dynamics. This will assist in our understanding of how this species functions in its environment, enabling better management practices to be formulated.

Protection of Populations

Protecting the populations of *C. elegans* has been neither fast nor fun. Every small step forward is seen as a huge leap and progress is slow. Rather than bore you with the trials of many sites we have selected a few populations to discuss the progress of their protection.

- Our major achievement



has been to develop a Voluntary Conservation Agreement under the National Parks and Wildlife Act, 1974, in the Illawarra region. This agreement is between a private landholder (developing *C. elegans* habitat) and the NSW National Parks and Wildlife Service. This has involved over a year of constant negotiations to finally secure the area. Further Conservation Agreements and development controls are presently being negotiated for other dry rainforest remnants in the area.

- The populations at Koora-gang Island, in the Hunter Region, which were thought to be extinct but were rediscovered at the beginning of this year, really highlight the vulnerability of our endangered species. Had these populations not been located when they were it may have been too late. The area where *C. elegans* occurs is the subject of an extensive wetland and rainforest rehabilitation project being undertaken by the Department of Public Works and Shortland Wetlands Centre.

We are currently liaising with the project manager for the rehabilitation of the remnant habitat back to rainforest, to ensure the long term protection for *C. elegans*. The rainforest area is currently being fenced to alleviate the threat of grazing. The restoration program will begin in the New year.

- A small population has been located in four individual remnants in Killalea State Recreation Area, in the Illawarra region. This land is owned by the Dept of Conservation and Land Management and managed by a Trust. There have been two bush regeneration

programs operating through the Department of Employment, Education and Training.

A number of plants were slashed by workers prior to locating the plant. Luckily all but one has resprouted. This alerted the workers to the importance of what they were doing and subsequently when tidying up more plants were located.

The Service is continuing to liaise with the management of KSRA. This reserve is not only the home of our endangered mate *C. elegans*, but also the nationally endangered *Pimelea spicata* and vulnerable *Zieria granulata*.

- Calmsley Hill City Farm in Western Sydney is owned by the NSW Dept of Planning and managed by Fairfield City Council. *C. elegans* was discovered here as a small population in severely degraded dry rainforest grazed by cattle, donkeys and rabbits. The area is now being fenced to exclude the cattle and donkeys and rabbit control programs will begin in the near future. A bush regeneration program is being undertaken.

- At Knob Hill in the Illawarra region, *C. elegans* occurs in dry rainforest remnants proposed for housing development. The local council has deferred the rezoning of the area to residential in the hope of making a wildlife corridor which would link two populations of *C. elegans*. This would also protect the habitat of *Zieria granulata*. The end result of this is pending Council's final decision.

In protecting threatened plants it appears that you have to be on the ball, at the right place at the right time and make good contacts. It re-

ally is essential that Local Government agencies throughout Australia become involved in the ANPC, for it is with them the decisions are made which determine the fate of our threatened plants.



Diary

Saturday February 18, 1995
ANPC Sub-tropical Group Meeting, Ipswich, Qld. see page 11 for details

Saturday February 25 1995
ACT and South East NSW Region Meeting, Canberra, see page 11 for details

March 27 - April 7, 1995
ANPC Plant Conservation Techniques Training Course.
 Contact: Kathy Korsch, Canberra Institute of Technology, 06-207 4177 or ANPC National Office, 06-2509509 for further details

September 25-29, 1995,
BGCI 4th International Botanic Gardens Conservation Congress, Perth, WA, Contact: Dr Kingsley Dixon, Kings Park, 09-321 5065, fax 09-322 5064. (See page 1)

September 27 1995, 2nd ANPC National Conference, Perth, WA. Contact: ANPC, 06-2509509. (See page 1)

Restoration of Lake Pedder

Lake Pedder, located in Tasmania's south-west, was formed about 10-15,000 years ago in a depression behind glacial outwash material. It covered about 10 square km and was unique in Australia. Each summer a small drop in water level exposed a large additional area of beach. By late summer the 2.75 km-long beach was nearly 800m wide and was a very distinctive feature of the Lake. Lake Pedder was flooded in the early 1970s amid considerable opposition to form the Serpentine and Huon Impoundments which are part of Tasmania's hydroelectric scheme.

A campaign was recently commenced to restore the original Lake Pedder and its associated vegetation. This restoration of Lake Pedder would involve slowly releasing water from the Serpentine and Scotts Peak dams. The Gordon Dam would not be affected by this proposal as it does not make up part of the Lake Pedder Impoundment. Both the dam and the Gordon power station would remain.

In early 1994 1000 delegates of the IUCN (International Union for the Conservation of Nature) passed a motion calling on the Australian Government to back the restoration of Lake Pedder 'as a symbol of hope that humanity can recover some of the global heritage lost over the last century'. However, the draining of the Lake Pedder Impoundment is not a first. In north-west USA, two large dams on the Elwha River are coming down after 82 years to restore the salmon and trout

fishery. Even the Elwha dams will not be the first in the the USA to be removed for environmental restoration.

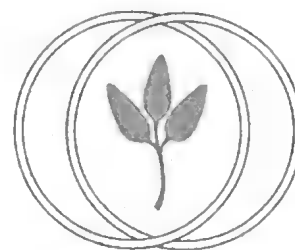
It is believed that the two decades of inundation will not have changed the Lake Pedder's basic geography and that once the rehabilitation work has been completed, the area will take its place as a worthy part of the World Heritage area, functioning and evolving in response to natural processes. Sonar studies of the drowned lake by Professor Peter Tyler and a team from Deakin University have shown that all of the major geophysical features of the original Lake Pedder remain intact and sediment accumulation on the floor of the new reservoir has been minimal. This is consistent with known long term deposit rates documented for other lakes since the retreat of the glaciers that formed them at the end of the last ice age. The well-known beach is intact and the dune also remains in position.

The plains surrounding the Lake are blanketed with a thick layer of peat. Much of this area was too water-logged to support trees and the natural vegetation was dominated by sedges, and particularly button grass (*Gymnoschoenus sphaerocephalus*). It has been noted that the initial draining of the impoundment will possibly leave a 'muddy mess' but it is anticipated that within a year the area will begin to regenerate and that rain will wash the beach and the dunes clean. It is thought that most of the necessary restoration will happen by natural processes including the

recolonisation by vegetation. The need for the reintroduction of plant species to the area will still need to be assessed. The extent and distribution of the silt will have some bearing on the regrowth of vegetation but it is thought unlikely that this will be a big problem. A major concern is the fate of the dunes. Some damage could have occurred to the dunes and to the soil profile that may be important for the re-establishment of the small forested area.

While it is not clear whether any of the endemic species which inhabited Lake Pedder can be restored, it is argued that at least as a physical feature and in the aesthetic sense, the lake can be restored. Whether the restored Lake Pedder will be able to provide habitat again for all of the plant species that vegetated the area only time will tell.

The campaign to restore Lake Pedder is known as *Pedder 2000*. The degree of national and international interest shown has been increased by the area's status as world heritage and the earlier controversy. If you wish to obtain more information then write to Pedder 2000, 130 Davey Street Hobart Tasmania 7000.



The Australian Trust for Conservation Volunteers

Want to help ?

The Australian Trust for Conservation Volunteers aims to conserve the environment through involving the community in 'hands-on' projects. If you are between 15 and 70, are reasonably fit and enjoy 'environmentally friendly' activities, the ATCV conservation projects could be the thing for you. You don't need special skills as all training and direction is provided.

The ATCV is a non-profit, non-political community based organisation which operates in every state and territory of Australia, and is Australia's largest practical conservation group. Under the guidance of employed and trained field officers and program managers, you could assist in projects such as revegetation, seed collection, fence construction, walking track maintenance, weed and vermin control, heritage restoration, wildlife and other scientific research. ATCV volunteers work on public and private land including forests, grasslands beaches, parklands and farmland. ATCV provides a field officer, transport, accommodation and basic handtools for all projects.

Local offices run week-long and weekend programs. Unemployed people who complete projects of three weeks or longer receive an achievement certificate and, if appropriate, a reference.

Anybody with a healthy interest in the environment is welcome to join the ATCV.



Need some help?

The Australian Trust for Conservation Volunteers can help you make the most of scarce conservation project resources. ATCV seeks to assist land managers with practical conservation projects. The Trust provides equipped and supervised teams of up to 10 volunteers to help with labour-intensive projects.

The services that the Trust can offer project managers include:

- Restoration of rivers and wetlands
- Recycling surveys
- Environmental weed control
- Boardwalk construction
- Track maintenance
- Heritage projects
- Fencing
- Seed collection
- Direct seeding
- Feral animal management programs
- Habitat regeneration and protection
- Fauna and flora survey and monitoring
- Endangered species protection
- Tree planting

The trust works with private landholders, local government authorities, government departments, research organisations, landcare groups, private companies, pastoralists and farmers, schools and universities, community groups and all land managers.

The ATCV supplies a team leader to co-ordinate and supervise the volunteers and to liaise with the project co-ordinator, transport for the volunteers, basic hand tools, first aid equipment, food for the volunteers and administrative support. As project co-ordinator you will need to supply planning and preparatory work, necessary materials, accommodation if required plus all specialised tools and safety equipment.

The Trust has been operating in Australia since 1982 and completes more than 1000 projects annually. ACTV is a member of the Australian Network for Plant Conservation.

For further information about the Trust contact the ATCV Head Office at Box 423 Ballarat, Vic 3353, phone 053-331483, fax 053-332 290

Plant conservation projects funded under the Endangered Species Program

This is a list of plant conservation projects funded under the Commonwealth Government's Endangered Species Program. If you would like to be involved in Recovery Programs or wish to know more about a specific program, contact the project officer whose name follows the project title. For information about the Endangered Species Program contact The Director, Endangered Species Unit, Australian Nature Conservation Agency, PO Box 636, Canberra, ACT 2601

Australian Capital Territory

Lowland Grasslands in the ACT Research Plan
Ms Sarah Sharp, Department of Environment,
Land and Planning, PO Box 1119,
TUGGERANONG, ACT 2901, tel 06 2072125, fax
06 2072122

New South Wales

A listing of rare or threatened plants for New
South Wales
Mr David Keith, National Parks and Wildlife
Service, PO Box 1967, HURSTVILLE, NSW 2220
tel 02 5856496 fax 02 5856555

Preparation of species outlines for rare and threat-
ened plants in north-east New South Wales

Achronychia littoralis Recovery Plan
Diploglottis campbellii Recovery Plan
Elaeocarpus williamsianus Recovery Plan

Fontainea oraria Recovery Plan
Grevillea beadleana Recovery Plan
Olearia flocktoniae Recovery Plan
Thesium australe Recovery Plan
Zieria prostrata Recovery Plan

Ms Suzanne Byrne, National Parks and Wildlife
Service, PO Box 97, GRAFTON, NSW 2460
tel 066 420591, fax 066 420619

Allocasuarina glareicola and *Persoonia nutans* Recov-
ery Plan (writing) and conservation research
statement

Cynanchum elegans Recovery Plan
Epacris hamiltonii Recovery Plan
Gentiana wingecarribiensis Recovery Plan
Pimelea spicata Recovery Plan

Ms Sharon Nash, National Parks and Wildlife
Service, PO Box 95, PARRAMATTA, NSW
2124, tel 02 8957769, fax 02 8957414

Eriocaulon carsonii Research Plan
Dr Nick Sheppard, National Parks and
Wildlife Service, PO Box 459, BROKEN HILL,
NSW 2880
tel 080 870804

Grevillea wilkinsonii Recovery Plan
Mr Geoff Winnett, National Parks and
Wildlife Service, PO Box 472, TUMUT, NSW
2720
tel 069 474200, fax 069 474170

Northern Territory

Assessment of poorly known (category K)
plant species in the NT
Dr Greg Leach, Conservation Commission of
the Northern Territory, PO Box 496,
PALMERSTON, NT 0831
tel 089 894514, fax 089 894510

Ptychosperma bleeseri Recovery Plan
Mr David Liddle, Conservation Commission
of the Northern Territory, PO Box 49, PALM-
ERSTON, NT 0831
tel 089 221744, fax 089 221739

Queensland

Alectryon ramiflorus Recovery Plan (survey
and writing)
Dr Gordon Guymer, Department of
Environment and Heritage, Meiers Road, IN-
DOOROPILLY, QLD 4068
tel 07 8779325, fax 07 3716655

South Australia

Acacia cretacea Recovery Plan
Acacia whibleyana Research Plan
Brachyscome muelleri Research Plan
Prostanthera eurybioides Recovery Plan
Pterostylis arenicola Recovery Plan
Pultenaea trichophylla Recovery Plan
Dr Manfred Jusaitis, Black Hill Flora Centre,
Maryvale Road, ATHELSTONE, SA 5076
tel 08 3363755, fax 08 3361827

Caladenia behrii (Pink Spider Orchid) Recovery Plan
Caladenia gladiolata (Bayonet Spider Orchid) Recovery Plan
Caladenia rigida (White Spider Orchid) Recovery Plan
Mr Robert Bates, c/o SA Herbarium, tel 08 223 1809

Tasmania

Carex tasmanica Recovery Plan
Euphrasia species Research Plan
Phebalium daviesii Recovery Plan (writing)
Prasophyllum concinnum Recovery Plan
Ranunculus prasinus Recovery Plan
Mr Stephen Harris, Department of Environment and Land Management, GPO Box 44A, HOBART, TAS 7001
tel 002 332543, fax 002 333477

Eucalyptus morrisbyi Recovery Plan
Mr Stewart Blackhall, Department of Environment and Land Management, GPO Box 44A, HOBART, TAS 7001
tel 002 336585, fax 002 333477

Victoria

Alpine and Sub-alpine Stream and Bog Communities Research Plan (writing) and implementation
Dr Ian Mansergh, Department of Conservation and Natural Resources, PO Box 41, EAST MELBOURNE, VIC 3002
tel 03 4124743, fax 03 4124586
Box-Ironbark public awareness resources

Box-Ironbark threatened flora survey
Psoralea parva Recovery Plan
Tall *Astelia* Recovery Plan
Mr Adrian Moorrees, Department of Conservation and Natural Resources, PO Box 137, HEIDELBERG, VIC 3084
tel 03 4508696, fax 03 4508799

Prasophyllum chasmogamum (Gaping Leek-orchid) Recovery Plan
Mr Ian Lunt, LaTrobe University, BUNDOORA, VIC 3083, tel 051 523625, fax 051 520444

Prasophyllum diversiflorum Recovery Plan (writing) and interim management
Mr John Fisher, Department of Conservation and Natural Resources, PO Box 471, PORTLAND, VIC 3305, tel 055 233232, fax 055 235312

Western Plains Grasslands Research Plan
Mr John Stuwe, Department of Conservation and Natural Resources, PO Box 41, EAST MELBOURNE, VIC 3002
tel 03 4508645, fax 03 4508799

Western Australia

Acacia leptalea (Chinocup Wattle) and *Verticordia fimbriilepis* (Shy Featherflower) Recovery Plan (writing and interim management)
Katanning District: survey of 94 priority flora taxa
Mr Mal Graham, Department of Conservation and Land Management, PO Box 811, KATANNING, WA 6317
tel 098 211296, fax 098 212633

Albany District Threatened Flora Management Plan
Mr Kelly Gillen, Department of Conservation and Land Management, 44 Serpentine Road, ALBANY, WA, 6330
tel 098 417133, fax 098 413329

Banksia cuneata (Matchstick Banksia) Recovery Plan

Mr Greg Durell, Department of Conservation and Land Management, PO Box 100, NARROGIN, WA 6312
tel 098 811113, fax 098 811645

Central Forest and Southern Forest Districts Threatened Flora Management Plan (writing)
Nineteen Critical Plant Taxa Recovery Plans
Mr Andrew Brown, Department of Conservation and Land Management, PO Box 51, WANNEROO, WA 6065
tel 09 4055166, fax 09 3061641

Conservation biology and management of endangered *Lambertia* species
Three Endangered *Dryandra* species: research, writing and interim management
Population dynamics and seed biology of endangered *Eremophila* species
Dr David Coates, Department of Conservation and Land Management, PO Box 104, COMO WA 6152
tel 09 3090490, fax 09 334 0515

Eucalyptus rhodantha (Rose Mallee) Recovery Plan

Ms Anne Kelly, Department of Conservation and Land Management, PO Box 104, COMO, WA 6152
tel 09 334 0503, fax 09 3340515

Geraldton District Threatened Flora Management Plan (writing)

Ms Sue Patrick, Department of Conservation and Land Management, PO Box 104, COMO, WA 6152, tel 09 3340485, fax 09 334

Grevillea scapigera (Corrigin Grevillea) Recovery Plan

Towards cryopreservation of rare and endangered Australian plants
Dr Kingsley Dixon, Kings Park and Botanic Garden, WEST PERTH, WA 6005
tel 09 3215065, fax 09 3225064

Lake Toolibin Recovery Plan

Mr Ken Wallace, Department of Conservation and Land Management, PO Box 100, NARROGIN, WA 6312
tel 098 811444, fax 098 813297

Merredin District Flora Management Program (implementation)

Stylidium coroniforme (Wongan Trigger Plant) Recovery Plan
Mr Mike Fitzgerald, Department of Conservation and Land Management, PO Box 332, MERREDIN, WA 6415
tel 090 412488, fax 090 412454

Phytophthora and *Diplodina* canker control in WA

Dr Tony Start, Department of Conservation and Land Management, PO Box 51, WANNEROO, WA 6065
tel 09 4055100, fax 09 3061641

Rulingia sp. (Tringwell Bridge) (Tringwell's *Rulingia*) Recovery Plan

Mr Ray Smith, Department of Conservation and Land Management, North Boyanup Road, BUNBURY, WA 6230
tel 097 254300, fax 097 254351

The Endangered Species Program

The Endangered Species Program (ESP) aims to prevent further extinctions of Australian flora and fauna, and to restore endangered species and ecological communities to a secure status in the wild. The ESP addresses the problem of species decline in Australia in the following three ways: identifying those species and communities which are threatened, and the processes that threaten them; establishing management programs to ensure the conservation of threatened species and communities, and to ameliorate the processes which threaten them; and educating and generating public support for management action. The complementary Feral Pests Program contributes to many endangered species projects by funding the feral animal control components of a number of recovery plans for threatened species, and by funding action on the four vertebrate pests listed as key threatening processes under the Endangered Species Act.

THE AUSTRALIAN NETWORK FOR PLANT CONSERVATION MEMBERSHIP LIST

The date (1994/5) indicates that the member has joined or renewed for that year. Addresses and names of contact persons are available from the National Office.

Corporate Members

ACT Parks & Conservation Service, (1994)
Australian Forestry Council
Australian Mining Industry Council
Australian Tree Seed Centre, CSIRO, (1994)
Botanic Gardens of Adelaide, SA (1994)
Albury Botanic Gardens, NSW (1994)
Alcoa of Australia Ltd., WA (1994)
Australian National Botanic Gardens (1994)
Aust. Nature Conservation Agency (1994)
Barcaldine Shire Council (1994)
Brisbane Botanical Gardens (1994)
CSIRO, Division of Plant Industry
Coffs Harbour City Council, NSW (1994)
Conservation & Land Management, WA (1995)
Conservation Commission of the NT (1994)
Eurobodalla Botanic Garden, NSW (1994)
Flecker Botanic Gardens, Qld (1995)
City of Frankston, Vic, (1995)
George Caley Botanic Garden, NSW, (1994)
Gladstone Tondoon Botanic Gardens, Qld (1995)
Kings Park and Botanic Gardens, WA (1995)
Kuringai Municipal Council, NSW (1994)
NSW-National Parks and Wildlife Service, (1994)
Norfolk Island Botanic Garden (1994)
North Forest Products, Tas (1994)
Pacific Power, NSW (1994)
Parks Wildlife and Heritage, Tas (1995)
Randwick City Council NSW (1994)
Royal Botanic Gardens, Melbourne, Vic
Royal Botanic Gardens, Sydney, NSW, (1994)
Royal Tasmanian Botanical Gardens (1994)
Townsville Botanic Gardens, Qld (1994)
Wollongong Botanic Gardens (1994)
Zoological Parks Board of New South Wales (1994)
Zoological Board of Victoria (1994)

International Associates

Botanic Gardens Conservation Intl, UK
Center for Plant Conservation, USA
Honiara Botanic Gardens, Solomon Islands
Kebun Raya Indonesia
Missouri Botanical Gardens Library, (1995)
National Botanical Institute, South Africa
Rare Plant Consortium, USA
Society for Ecological Restoration, USA
Suva Botanical Gardens, Fiji, (1994)
Vailima Botanic Gardens, Western Samoa

Other Organisations

Arid Land Botanic Garden, SA, (1994)
Assn. of Soc. for Growing Aust Plants (1994)
Australian Assn. of Bush Regenerators (1994)
Aust. Trust for Conservation Volunteers (1994)
Brunswick Valley Heritage Park, NSW (1994)
Burrendong Arboretum Trust, NSW (1994)
Deakin University, Rusden Campus Library, Vic
Earth Repair Foundation (1994)
Friends of North Coast Regional BG, NSW (1994)
Friends of the Points, Vic (1994)
Greening Australia (ACT) (1994)
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